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Connector for Saturated Standard Cells

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U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards

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CONNECTOR FOR SATURATED STANDARD CELLS

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Connector for Saturated Standard Cells

by

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ABSTRACT

This paper describes a connector used for making electrical connections to saturated standard cells in oil baths. The connector has at least three advantages over other methods in common use. These advantages are namely: (1) it does not generate thermoelectromotive forces; (2) it allows cell racks to be placed close together in the bath; and (3) it is economical to fabricate since it can be made from a common inside caliper.

Key Words: connector, electromotive force, oil baths, standard cells, thermoelectric.

CONNECTOR FOR SATURATED STANDARD CELLS

Saturated standard cells, when used in temperature-controlled oil baths, are mounted in racks with provisions made for electrical connections.

For many years, most saturated standard cells were used in racks utilizing mercury cups as the means for electrical contact.

About a decade ago, commercially produced cell racks, with rigid copper contact posts, were introduced for use in oil baths as well as air baths, and today this type is used extensively. Several methods of connecting to the copper posts of this type of rack have been used, including spring clips, alligator clips, etc. In these procedures there is danger of shorting the connections and thus destroying the cell. The possibility also exists that unwanted thermoelectromotive forces will be created by the dissimilar metal of the clips. Additionally, the bulkiness of some of these connections makes it necessary to maintain an appreciable distance between the cell racks, which can seriously reduce the usable capacity of the bath.

A connector that has been designed for making these connections is shown in Fig. 1. It is convenient to use, thermal free, and cannot accidentally short the cell connections. It is a special type of connector in that it is designed to fit between the posts of the cell rack. This feature allows the cell racks to be placed close together. Therefore, a bath of given size is able to accommodate more cells than might be possible with the methods mentioned previously. The connector is versatile as it can be used with different cell racks even though the spacing between the connecting posts may vary appreciably. It is inexpensive and is easily fabricated from a common inside caliper of the type used in the machine shop.

The connector (as shown in Fig. 2) is operated by depressing the acrylic plastic grips (4) and when it is placed on the cell rack (10), an outward pressure of the steel arms (5), made possible by the "C" spring (1) and pivot pin (3), forces the acrylic plastic insulating blocks (7), with special copper contact points (8), to fit against the inside of the cell rack posts (9). Connecting wires are soldered to the contact points (6) and inserted through holes (7) extending through and out of the top of the insulating blocks. The maximum outward travel of the arms is controlled by the screw stop (2).

The connector may be disassembled by outward pressure of the arms, forcing the "C" spring to snap off. It may be reassembled in the reverse manner.

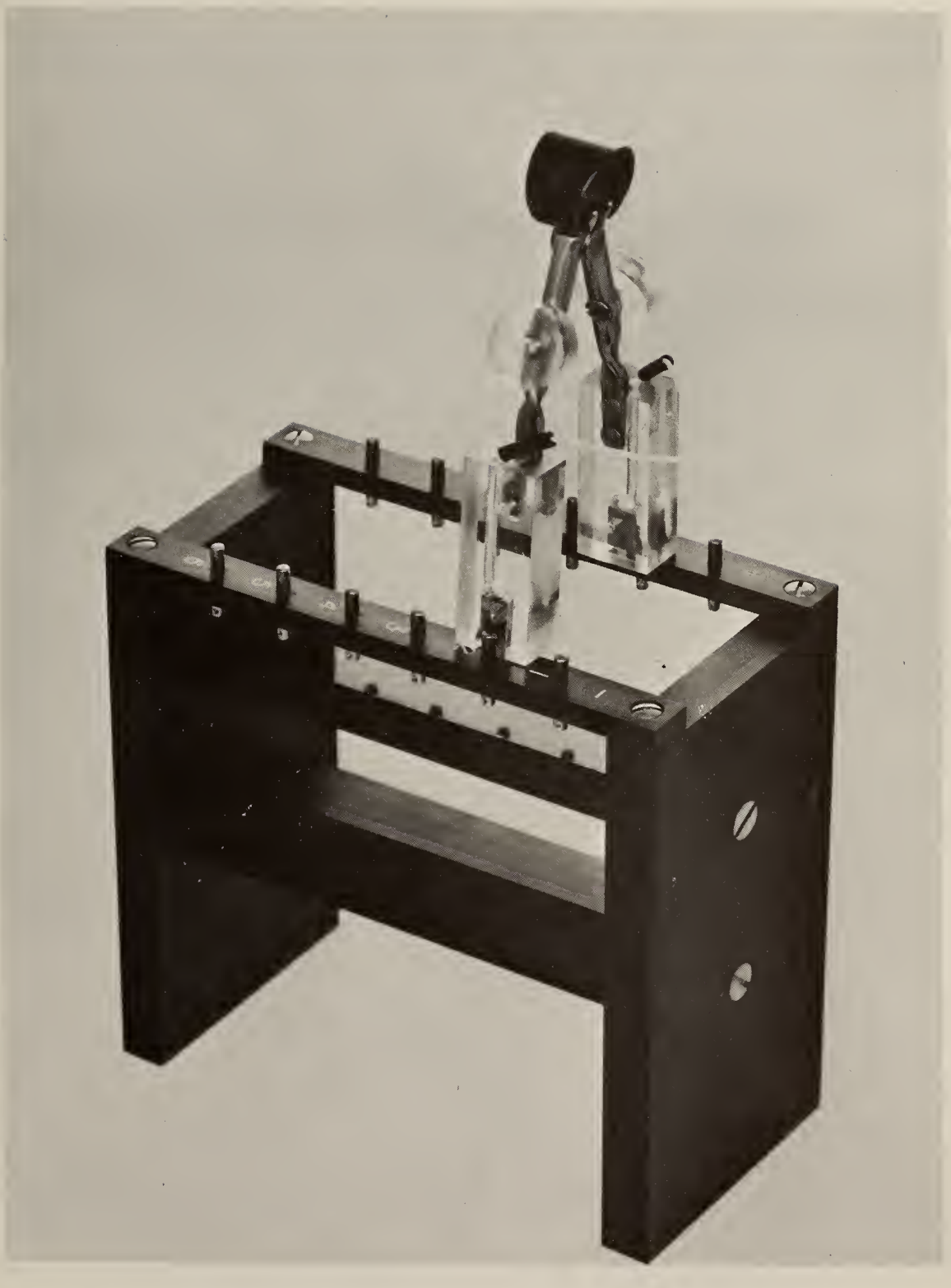

Fig. 1 Photograph of connector mounted on standard-cell rack

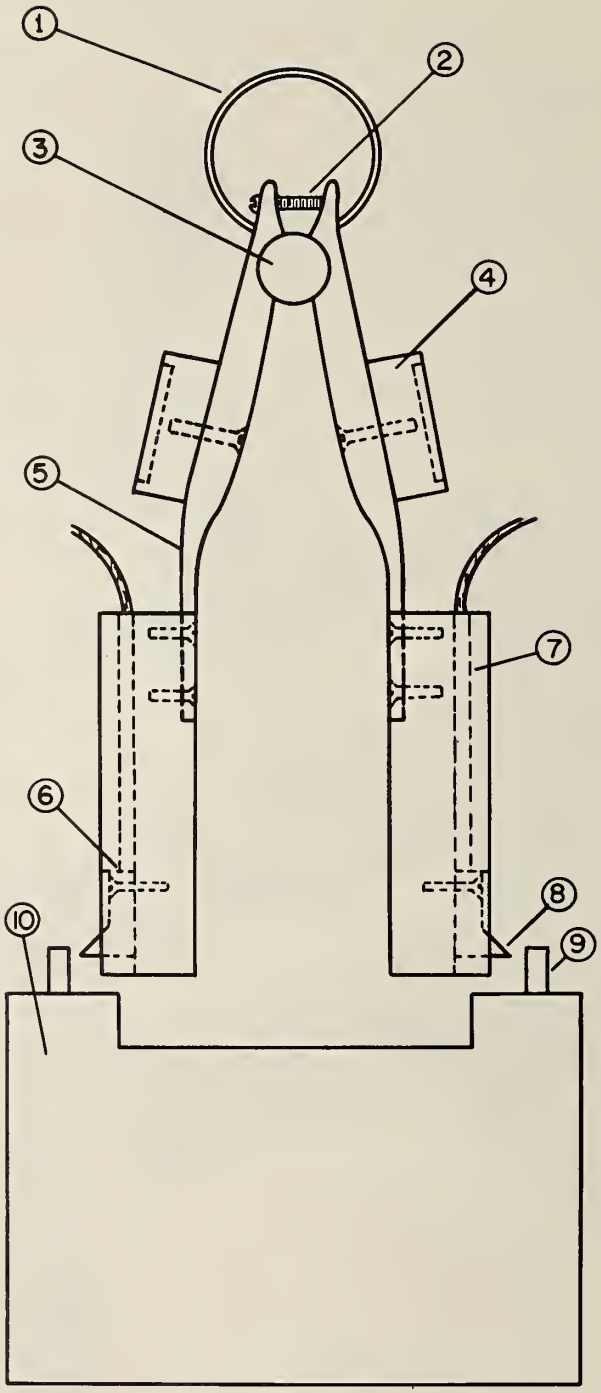

Fig. 2 Construction detail of connector

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